Math 212
Quiz 20

M 17 Oct 2016

Your name: _____

Exercise

(2 pt) Let $D \subseteq \mathbf{R}^2$ be the region in the upper half plane (i.e. $y \geqslant 0$) bounded by the circle C : $x^2 + y^2 = 4$ and the lines $y = x$ and $y = -x$.

(a) (0.5 pt) Sketch and shade the region D. *Hint:* The point $(0, 1) \in D$.

(b) (1.5 pt) Let $f : \mathbf{R}^2 \to \mathbf{R}$ be the function

$$f(x, y) = 2xy.$$

Set up (but do NOT evaluate) an iterated (!) integral for $\iint_D f(x, y)\, dA$ **using polar coordinates**. *Hint:* Describe the region D algebraically using polar coordinates. When writing the iterated integral, remember to translate (x, y) to (r, θ), and mind your integration factor.